Pushing the Envelope			
2009 Mathematics			
Core Curriculum			
Iowa Mathematics			
Grades 3-5			
Activity/Lesson	**State**	**Standards**	
History of Aviation Propulsion (pgs. 5-9)	IA	MA.3-5.3.6.5	Select and apply appropriate standard (customary and metric) units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. Select and apply appropriate units, strategies and tools to solve problems that involve estimating and measuring weight, time and temperature.
Types of Engines (pgs. 11-23)	IA	MA.3-5.3.5.5	Use geometric models to solve problems, such as determining perimeter, area, volume, and surface area. Develop, understand and use formulas to find the area of rectangles, related triangles and parallelograms and learn to measure the necessary attributes of shapes.
Chemistry (pgs. 25-41)	IA	MA.3-5.3.5.5	Use geometric models to solve problems, such as determining perimeter, area, volume, and surface area. Develop, understand and use formulas to find the area of rectangles, related triangles and parallelograms and learn to measure the necessary attributes of shapes.
Chemistry (pgs. 25-41)	IA	MA.3-5.3.6.1	Select and apply appropriate standard (customary and metric) units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. Select appropriate units, strategies, and tools to solve problems that involve estimating and measuring perimeter, area and volume.
Chemistry (pgs. 25-41)	IA	MA.3-5.3.6.5	Select and apply appropriate standard (customary and metric) units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. Select and apply appropriate units, strategies and tools to solve problems that involve estimating and measuring weight, time and temperature.
Physics and Math (pgs. 43-63)	IA	MA.3-5.2.3.1	Understand and apply the idea of a variable as an unknown quantity and express mathematical relationships using equations. Use invented notation, standard symbols and variables to express a pattern, generalization, or situation.
Physics and Math (pgs. 43-63)	IA	MA.3-5.2.4.5	Represent and analyze patterns and functions, using words, tables, and graphs. Be able to use various techniques including words, tables, numbers and symbols for organizing and expressing ideas about relationships and functions.

Physics and Math (pgs. 43-63)	IA	MA.3-5.3.5.5	Use geometric models to solve problems, such as determining perimeter, area, volume, and surface area. Develop, understand and use formulas to find the area of rectangles, related triangles and parallelograms and learn to measure the necessary attributes of shapes.
Rocket Activity (pgs. 69-75)	IA	MA.3-5.3.5.5	Use geometric models to solve problems, such as determining perimeter, area, volume, and surface area. Develop, understand and use formulas to find the area of rectangles, related triangles and parallelograms and learn to measure the necessary attributes of shapes.
Pushing the Envelope			
2009 Mathematics			
Core Curriculum			
Iowa Mathematics			
Grades 6-8			
Activity/Lesson	**State**	**Standards**	
Types of Engines (pgs. 11-23)	IA	MA.6-8.2.1.1	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Write mathematical expressions, equations, and formulas that correspond to given situations.
Types of Engines (pgs. 11-23)	IA	MA.6-8.2.1.8	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Use expressions, equations, and formulas to solve problems, and justify their solutions.
Chemistry (pgs. 25-41)	IA	MA.6-8.2.1.1	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Write mathematical expressions, equations, and formulas that correspond to given situations.
Chemistry (pgs. 25-41)	IA	MA.6-8.2.1.8	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Use expressions, equations, and formulas to solve problems, and justify their solutions.

Physics and Math (pgs. 43-63)	IA	MA.6-8.1.4.1	Understand and apply ratio and rate, including percents, and connect ratio and rate to fractions and decimals. Build on understanding of fractions and part-whole relationships to understand ratios (by, for example, analyzing the relative quantities of boys and girls in the classroom or triangles and squares in a drawing).
Physics and Math (pgs. 43-63)	IA	MA.6-8.1.4.3	Understand and apply ratio and rate, including percents, and connect ratio and rate to fractions and decimals. Understand equivalent ratios as deriving from, and extending, pairs of rows (or columns) in the multiplication table.
Physics and Math (pgs. 43-63)	IA	MA.6-8.1.4.5	Understand and apply ratio and rate, including percents, and connect ratio and rate to fractions and decimals. Use a variety of strategies to solve problems involving ratio and rate.
Physics and Math (pgs. 43-63)	IA	MA.6-8.1.5.1	Understand and apply proportional reasoning. Understand that a proportion is an equation that states that two ratios are equivalent.
Physics and Math (pgs. 43-63)	IA	MA.6-8.1.5.3	Understand and apply proportional reasoning. Understand that in a proportional relationship of two variables, if one variable doubles or triples, for example, then the other variable also doubles or triples, and if one variable changes additively by a specific amount, a, then the other variable changes additively by the amount ka.
Physics and Math (pgs. 43-63)	IA	MA.6-8.1.5.4	Understand and apply proportional reasoning. Graph proportional relationships and identify the constant of proportionality as the slope of the related line.
Physics and Math (pgs. 43-63)	IA	MA.6-8.1.5.5	Understand and apply proportional reasoning. Use ratios and proportionality to solve a wide variety of percent problems, including problems involving discounts, interest, taxes, tips, and percent increase or decrease.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.1.1	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Write mathematical expressions, equations, and formulas that correspond to given situations.

Physics and Math (pgs. 43-63)	IA	MA.6-8.2.1.2	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Understand that variables represent numbers whose exact values are not yet specified, use single letters, words, or phrases as variables, and use variables appropriately.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.1.5	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Understand that solutions of an equation are the values of the variables that make the equation true.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.1.8	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Use expressions, equations, and formulas to solve problems, and justify their solutions.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.2.4	Understand and apply proportionality. Use ratios and proportionality to solve a wide variety of percent problems, including problems involving discounts, interest, taxes, tips, and percent increase or decrease.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.3.1	Understand, solve, and apply linear equations and inequalities. Make strategic choices of procedures to solve linear equations and inequalities in one variable and implement them efficiently.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.3.6	Formulate linear equations and inequalities in one variable and use them to solve problems, including in applied settings, and justify the solution using multiple representations.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.4.2	Understand that the slope of a line is constant, for example by using similar triangles (e.g., as shown in the rise and run of "slope triangles"), and compute the slope of a line using any two points on the line.
Physics and Math (pgs. 43-63)	IA	MA.6-8.2.4.6	Understand and apply linear functions. Use linear functions, and understanding of the slope of a line and constant rate of change, to analyze situations and solve problems.
Physics and Math (pgs. 43-63)	IA	MA.6-8.3.1.3	Understand, determine, and apply area of polygons. Understand and apply formulas to find area of triangles and quadrilaterals.

Rocket Activity (pgs. 69-75)	IA	MA.6-8.2.1.1	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Write mathematical expressions, equations, and formulas that correspond to given situations.
Rocket Activity (pgs. 69-75)	IA	MA.6-8.2.1.8	Write, interpret, and use mathematical expressions and equations, find equivalent forms, and relate such symbolic representations to verbal, graphical, and tabular representations. Use expressions, equations, and formulas to solve problems, and justify their solutions.
Rocket Activity (pgs. 69-75)	IA	MA.6-8.3.1.3	Understand, determine, and apply area of polygons. Understand and apply formulas to find area of triangles and quadrilaterals.
Pushing the Envelope			
2009 Mathematics			
Core Curriculum			
Iowa Mathematics			
Grades 9-12			
Activity/Lesson	**State**	**Standards**	
Physics and Math (pgs. 43-63)	IA	MA.9-12.1.1	Students can understand and apply a variety of math concepts. Understand, analyze, represent, and apply functions
Physics and Math (pgs. 43-63)	IA	MA.9-12.1.4	Students can understand and apply a variety of math concepts. Understand, analyze, approximate, and interpret rate of change